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Article

Rethinking Urban Form: Switzerland as a "Horizontal Metropolis"

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Abstract
In light of the rapid population growth forecast for the coming years and the powerful transformations already occurring throughout its whole territory, today's Switzerland stands in urgent need of critical reflection on its urban future. A novel set of concepts and actions is needed in order to produce new visions and operational tools capable of critically reconsidering mainstream debates about Switzerland's future urban growth. On the one hand, national policies and narratives tend de facto towards lending increasing support to a dynamic of "metropolization," which usually leads to stronger territorial hierarchization strategies and processes aiming at a spatial condensation of urban services and functions in specific, selected locations. On the other hand, however, the Swiss territory—with its deep rootedness in federalism and its unique aggregative structure—still embodies key features of what, at different times, has been named a single "Grande Ville," a "dezentralisierte Großstadt," a "Ville-Territoire" or, more recently, "Stadtland Schweiz." The country as a whole is still characterized by extended and layered conditions of inhabitability, where the dispersion of the urban fabric, enmeshed within the agricultural and forested landscape, is articulated through horizontal rather that vertical relationships. This paper offers a novel reflection on how the ongoing metropolization process could be seen as a positive force if a markedly different idea of metropolitan space is introduced—the "Horizontal Metropolis." Its key idea is to distribute and enlarge the benefits which metropolization, if conducted in line with the tradition of decentralization and horizontality, could bring to the Swiss territory and its population. The "Horizontal Metropolis" concept recovers and leverages the various forms of inhabitability and their relation with the infrastructural support. It considers the long-term construction of the Swiss "City-Territory" as a renewable resource, which means reflecting on new life cycles, capitalizing on the urban and territorial embodied energy, and therefore rethinking, without denying it, Switzerland's extensive and diffused fixed capital. This could be a precious resource to accommodate future urban growth and reorient the form it takes, keeping at bay indiscriminate sprawl as well as its currently predominant ideological counterpart, indiscriminate densification and polarization.

Keywords
city-territory; diffused urbanization; growth; Horizontal Metropolis; recycling; Switzerland

Issue
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1. Introduction: Diffused Urbanization, Risks and Opportunities

> *…during the past decades, there were attempts to spell out what seemed new in European territories. It was not the periphery—a phenomenon which had already become evident during the twentieth century—nor was it the peri-urban or the process of suburbanization, which occurred during the first two thirds of the twentieth century. It was not something that was born in the city and, from the city, radiated outward into the territory. The novelty was the 'diffuse city'—something that had its roots in the territory, its inhabitants, and their history.* (Secchi, 2010, original in French)

In the last sixty years, urbanization has evolved dramatically, blurring the city/countryside divide and bringing about vast and complex territorial settlements of previously inconceivable size and population (Brenner, 2014; Burdett, 2008). Accordingly, many neologisms have emerged, clearly reflecting changing boundaries, morphologies and scales of human settlement patterns. Vast portions of the territory located outside historic centers, often in areas previously classified as "rural," have experienced rapid urbanization processes (Buijs, Tan, & Tunas, 2010), which has led certain scholars to think in terms of "planetary urbanization" (Brenner, 2014), taking up in a new guise Henry Lefebvre's hypothesis (Lefebvre, 1970). These processes have been, and still are, generating unprecedented "urbanized landscapes" (Secchi, 2011) characterized by a completely new ratio between built and open space (Brenner, 2009; Indovina, Fregolent, & Savino, 2005), as well as between permeable and impermeable surfaces (McGee, 2009; Viganò, 2013) inside what we now consider a "city." In Switzerland, for example, "open spaces" represent 85.5% of the surface of the territories classified as "agglomerations," against 71.6% of similar spaces located in "urban centers". The increasingly strong influence gained by open spaces within the urban ambit is crucial to the point of acquiring the ability to reshape the very concept of city (Bélanger, 2009; Berger, 2006, 2009).

The relatively recent assumption that some forms of urban dispersion, while entailing certain evident risks for the territory, can also represent a valid substrate for the construction of an innovative project for the city (Allen, 2003; McGee, 1991; Smets, 1986; Viganò, 2013), constitutes the area of research within which this article is developed and the hypothesis thanks to which it will attempt to formulate an ambitious conclusion.

In recent decades, with open space and landscape replacing architecture as the structuring elements of contemporary urbanism (Bélanger, 2009; Berger; 2009; Waldheim, 2006, 2016), the phenomena of urban dispersion have become important occasions to construct a broader vision of the city, capable of going beyond the metropolitan scale and overcoming old binary contrapositions such as center/periphery or town/country. With this shift, a twofold need arose: first, to recognize the limits of architecture's ability to order the city and second, to learn from the complex self-regulating orders already present in the urban fabric (Allen, 1999; Berger, 2009; Cadenasso, Pickett, McGrath, & Marshall, 2013; Pickett, Cadenasso, & McGrath, 2013). This led to the careful observation of often forgotten, hidden or barely perceptible, but ever more influential dynamics, making it possible for elements that had been neglected or overlooked up to now to emerge from the territorial matrix (Tjallingii, 1995; Viganò, 2008). Up until the early 1990s, the descriptive as well as interpretative reading of these territories was ruled by a predominantly urban-centric approach. The urban was seen as "occupying spaces" and provided the benchmark concepts for the critical reflection on guidelines for "valid" design hypotheses. In this picture, the rural dimension was seen as completely swallowed up and displaced by the urban sphere, in a sort of dualistic dialectical imaginary according which "mixed" dispersion tended to be replaced by the polarization between the "dense" urban and the "empty" rural. Despite the fact that numerous and in-depth analyses were being conducted, the prevailing approach remained one of refusal, inurement and inertia as far as the dispersed city was concerned.

Indeed, with the inversion of this trend and the recognition of open space as a structuring element for the city and the territory (Secchi, 1986; Viganò, 1999), the first half of the 1990s witnessed the beginning of a profound reconsideration of the role that "territories of dispersion" (Boeri, Metropolitani, Lanzani, & Marini, 1993; Munarin & Tosi, 2001; Viganò, 2001, 2004) might play, set against the myth of the "compact city"—along with the attempt to posit these territories as the basis for constructing a new urban principle. Several neologisms such as *città diffusa* (Indovina, 1990), *Desakota* (McGee, 1991) or *Zwischenstadt* (Sieverts, 1997) began to emerge and develop as evidence of a new intent to understand these new territorial forms in greater depth, to the point where the term "dispersed urbanization" ceased being a mere oxymoron (Grosjean, 2010). More recent interpretations even go as far as considering these territories of dispersion as forms of spatial, social and natural capital (Viganò, Secchi, & Fabian, 2016). Within a frame of thinking in which the role of open space becomes so crucial as to become structuring, it is not only possible but actually essential to deeply rethink and re-conceptualize "urban form."

However, within the great contemporary thrust towards urbanization, considering urban dispersion as an asset and not just as a mere threat for the construction of a sustainable city does not, by any means, imply that we can neglect the risks pointed out time and again by numerous scholars. The trends towards uncontrolled sealing of soil surfaces, towards the specialization and fragmentation of an originally "rural" or natural area into separate functions, and towards the widespread social marginalization often associated with such a process con-

tinue to feature deeply in the matrix of the dispersed city.

The degree of the changes underway and their potential point towards the need for an ambitious project for the city—a project capable, above all, of strategically using, as a deposit of "embodied energy" (Viganò et al., 2013), resources and tensions already harboured in the urban fabric (Berger, 2009). Our hypothesis is that an heterogeneous and polycentric city, structured upon open spaces and capable of integrating multiple functions, is already under construction. To try and understand it in order to convey its already ongoing development seems paramount. It is to this end that we would like to advance the notion of "Horizontal Metropolis."

1.1. The "Horizontal Metropolis": A Research Hypothesis

The "Horizontal Metropolis" is an oxymoron. Two contrasting terms are juxtaposed in order to conjugate the traditional idea of metropolis—the center of a vast territory, hierarchically organized, dense, vertical, produced by polarization—with the idea of horizontality—a more diffuse, isotropic urban condition, where the borders between center and periphery blur. Beyond the theme of the "peri-urban" or of the "sub-urban," the idea of "Horizontal Metropolis" refers to closely interlinked, copenetrating rural/urban realms, forming a decentralized and multi-polar, but cohesive and self-organizing system of communication, transport and economic activity. It is a layered territorial construction where agriculture and non-agricultural economic activities create an original mix (Viganò, Cavalieri, & Barcelloni Corte, 2016; Viganò, Secchi, & Fabian, 2016).

The *Ville-territoire* connecting Geneva to St. Gallen (Corboz, 1990), the *Città diffusa* of Northern Italy (Indovina, 1990), the *Desakota* in China, Japan, Thailand or Vietnam (McGee, 1991), the *Radiant Periphery* of the fine-grained dispersed settlement pattern in Flanders (Smets, 1986) the *Zwischenstadt* in Germany (Sieverts, 1997): these are only a few of the many examples that can be mobilized to clearly describe the emergence of a completely new urban condition that finds also in Switzerland its specific configuration, "a *Großstadt* in formation," as André Corboz writes in 1990 in *Vers la ville territoire*.

Mainstream trends view figures of urban dispersion mainly as a phenomenon to be highlighted or a problem to be solved. By contrast, the Horizontal Metropolis concept considers them as being beyond the themes of the "peri-urban" and the "sub-urban." They are therefore viewed as an asset for—rather than a limitation on—the construction of a sustainable, innovative urban and territorial project. In fact, in such territories, horizontality of infrastructure, urbanity and relations (among various parts as well as among peers), mixed use, and diffuse accessibility can generate specific habitable and ecologically efficient spaces.

A global and systemic attempt at understanding this specific spatial condition, capable of supplying a general and critical picture of these territorial figures and their particular growth dynamics, has never been fully carried out up to now. Rendered conceptually invisible by the conventional polarized way of thinking between the "dense" urban, the "empty" rural and the "bad" sprawl, they have never been acknowledged as true and proper cities and never been analyzed in comparative and systemic terms. For the same reasons, there is a dearth of strategies and projects capable of enhancing the opportunities offered by these territorial constructions and of addressing their limitations, as well as of carrying over practices across different but comparable case studies. The concept of "Horizontal Metropolis" is rooted in the perceived necessity of building a new awareness in order to observe and actively interact with these new forms of urbanization.

Beyond the construction of an interpretative concept, the "Horizontal Metropolis" is a research hypothesis that explores the possibility of designing a fully-fledged, specific project for the "City-Territory". The aim is to investigate and propose strategies that capitalize on the "City-Territory"'s already existing, and all too often overlooked, signature strengths—strategies to reinforce horizontal social and ecological relations in spaces in which imposed polarization and hierarchization processes are, on the contrary, weakening horizontal networks and disconnecting/marginalizing territories and populations. "City-Territories" are spaces that no longer have a clear "outside," so that they form a de facto urban ecosystem—a multipolar, non-hierarchical, mixed whole compelled to offer proof of its sustainability as an integrated system. They are spaces evidencing an urban condition characterized by non-arbitrary extension and by the existence of lastingly diffuse infrastructural supports, leading to distinctive forms of order and coexistence that differ significantly from the hierarchical one.

The "Horizontal Metropolis" concept is meant to give visibility, meaning and legitimacy to those numerous spaces in which metropolitan characteristics exist along with horizontality of infrastructure, urbanity and relations among the different parts as among peers. The hypothesis is that this horizontality, while generating a specific habitable space, can serve as the support for an innovative urban and territorial project. Today the "City-Territory," operates both as natural and spatial capital and as an agent of transformation; it is a both a support and a locus of potentiality (Viganò 2013; Viganò, Secchi, & Fabian, 2016).

Working on the "Horizontal Metropolis" as a specific spatial condition, as a vision and a hypothesis, requires reshaping the imagination of the architect and urbanist, removing it from orthodox and academic ways of thinking, away from a blind "either/or" pragmatism and from theories that cling to a handful of simplified, overriding images. In the effort to reimagine and reconstruct a different design approach, the specific characteristics of the "Horizontal Metropolis" can play an important role, revealing new territorial representations while acting as a mainstay for conceptual shifts.

2. The Case of Urban Switzerland

Nowadays, more and more research efforts are engaged in deconstructing deeply rooted assumptions in order to move closer to actual urban complexity. This article presents one of them and utilizes the "Horizontal Metropolis" concept to suggest a conceptual shift in order to overcome traditional perspectives that consider the compact city as the only "correct" form of urbanity. It will be used here as a lever to begin re-conceptualizing Switzerland's contemporary urban landscape.

2.1. Switzerland's Contemporary and Future Issues Related to Urbanization

In light of the rapid demographic growth forecast for the coming years (rising to a potential 10 million by 2050) and the deep transformations already occurring throughout its whole territory, today's Switzerland stands in urgent need of critical reflection on what its urban future might look like.

Settlement areas, especially those in the region between the Alps and the Jura mountains—the so-called "Plateau"—have been growing steadily over the last century and are now accelerating their growth at a rapid pace (see Figure 1). There is an intense ongoing discussion, at all levels of the country's administration, on the necessity of a "sustainable urban development" model. This inevitably opens up a broader debate on how this growth could or should be accommodated. At the moment, national policies and narratives tend to support and emphasize "metropolization dynamics" (Bassand, 2004) and, therefore, territorial hierarchization strategies and processes that aim for the spatial condensation of urban services and functions in specific, selected locations. The Swiss Confederation's increasingly strong measures clearly point in this direction, as the recent revision, in 2013, of the LAT (*Loi sur l'aménagement du territoire*) testifies. There is a trend towards drastically concentrating urban expansion through "densification strategies" such as, for example, the introduction of the "urban perimeter" concept with the associated creation of incentives for the use of unbuilt plots within the perimeter area. In the same vein, large-scale infrastructural projects involving big national investments with the aim of "shortening the distances" between national and international main urban nodes—such as the Gotthard Base Tunnel opened in 2016 or the Ceneri Tunnel expected to open in 2019—highlight the strong "selective" character of actual national territorial strategies.

In this framework, Switzerland appears to be set to put into force a gradual stiffening of its planning prescriptions and territorial strategies, in order to steer its landscape increasingly towards the concentration of its urban formations—with the danger of gradually diverting attention from "the rest of the territory" and producing territorial as well as socioeconomic marginality. The risk is that by adopting a mainstream conception of what its urban future and its growth model ought to be, Switzerland might gradually neglect and fail to maintain and renew the impressive infrastructural capital, as well as the associated natural and spatial capital, that has made its urban patterns so conducive to an unpolarized, polycentric, territorially egalitarian way of life. A novel set of concepts and actions is therefore needed in order to produce visions and operational tools capable of addressing future urban challenges, of overcoming paradoxes related to the current urban condition, and of critically reconsidering mainstream debates about Switzerland's future urban growth.

Figure 1. Urban Switzerland in 2014: built (white). Source: *Horizontal Metropolis, a radical project*, Venice Architecture Biennale 2016, Atlases.

2.2. Switzerland's Legacy of "Decentralized Centralization"

Switzerland was already described in the 18th century by Jean-Jacques Rousseau as a "big city divided into thirteen districts, some of which bridge valleys, others on slopes, others that straddle mountains" (Rousseau, 1763). Bolstered by a deeply rooted federalism and a unique aggregative structure, the country still nowadays represents an exemplary case of a "City-Territory" (Walter, 1994). Its decentralized distribution of power, in correlation with its tight intermeshing of urban and rural and the decentralization of its industrial production are all factors explaining why, since the dawn of Swiss national planning in the early 1930s, the term "city" was used to describe the country as a whole (Hildebrand, 2006).

Already in 1933, Armin Meili, who would later become first president of the Swiss Land Planning Association (founded in 1943), formulated the guiding principle of Switzerland as that of a *dezentralisierte Großstadt Mitteleuropas*, a "decentralized Central European metropolis" (Meili, 1933)—a principle which was to receive a lot of recognition in the years that followed. Meili had in mind a specifically "Swiss metropolitan development" where satellite towns, incorporating rural areas, were to be linked into "belts" (like "strings of beads") stretching across the whole country. Meili aspired to a decentralized Swiss Metropolis, made up of small and medium-sized cities capable of economic performance/competition and correlated with functional rural areas. "Politically, the aim of a widespread infrastructure made available to the entire territory was thus directly related to an equivalent economic development of mountains and peripheral regions" (Hildebrand, 2006). Over more than ten years and through a number of publications, he sketched a dynamics of decentralized metropolization capable of achieving an "extensive merging of the city and rural areas" (Meili, 1933) and to create a "close bond between the land and its residents" (Meili, 1941) which could cover an autonomously large portion of their own food requirements. The image of a "Swiss metropolitan zone stretching loosely from St Gallen to Geneva" (Meili, 1941) and offering the great advantage of making partial self-sufficiency possible, started to gradually gain credibility among planners, especially in a context of economic crisis and impending world war.

Without denying the economic and cultural significance of major cities, Meili argued that beyond a certain optimum dimension, disadvantages for excessively large cities were predominant. However, over and beyond this posture, Meili, like many others, clearly understood the fundamental importance of ensuring a "balance" within Switzerland's settlement structure, crucial also to maintaining the country's multilingual and multicultural structure (Hildebrand, 2006). The Confederation's spatial planning was influenced for decades by what we might call a notion of decentralized centralization, capable of envisaging a vast decentralized metropolis closely knit spatially and functionally, where the desired functions of a city cohered with the country's territorial and political specificities. This lasted up to the mid-1980s, when urban centers and conurbations began to globally capture the general political attention.

2.3. The Emergence of "Metropolization"-Related Dynamics

With the economic recovery and the strong push towards the metropolization of the territory (Bassand, Joye, & Schuler, 1988; Leresche, Joye, & Bassand, 1995), the Swiss national vision for a "decentralized centralization" began to fade, gradually being considered less and less adequate to the times and less and less achievable. Already in the early 1990s, the dynamic of "metropolization" worried its observers through the manner in which it was proceeding "without synergies with the region in a context of desertification and destruction of the hinterland" (Leresche & Bassand, 1991). Within the metropolitan fabric, a "twofold process was unfolding: while the metropolis supported innovation becoming a genuine pole of cumulative development, it generated the growth of social inequality and phenomena of exclusion" (Leresche & Bassand, 1991)—thus gradually coming into contradiction with a deep and long-entrenched territorial balance. With the revision of the Federal Constitution in 1999, which assigned a new role to the cities, and the associated development of the agglomeration policy, this process acquired more and more political weight, inaugurating a completely new era in planning (Leresche & Bassand, 1994; Schuler & Bassand, 1985).

Despite such a shift, the image of the "country as a city" that takes advantage of its territory as a whole persisted in the descriptions of several scholars, such as André Corboz who described Switzerland as "a Großstadt in formation" (Corboz, 1990), where "the inhabitants, regardless of where they live, have an urban mentality" (Corboz, 1990). Although increasingly remote from actually prevailing institutional positions, Corboz's interpretation of urbanity garnered a widespread and lasting attention that continues to this day. Franz Oswald, for example, defined the mix of city and countryside with the term New Urbanity (Oswald & Schüller, 2003). Angelus Eisinger and Michel Schneider, through the neologism Stadtland Schweiz—"Swiss city-countryside"—described the Swiss habitat as a new spatial and multifunctional entity—a collage of urban, suburban and rural elements which, together, form a polynuclear condensation zone (Eisinger & Schneider, 2005). Kees Christiaanse considered the picturesque rural landscape endemic to the city (Christiaanse, 2005).

However, despite this general and widespread understanding of the profound complexity and specificity characterizing the Swiss territory, an increasingly hierarchized interpretation of its urban landscape leading to the reinforcement of the "metropolization" dynamics (Bassand, 2004; Leresche et al., 1995) gradually took

hold, developed and gained consensus, especially at the level of the political and administrative institutions. For instance, the large-scale research project *Switzerland, an urban portrait* (Diener, Herzog, Meili, de Meuron, & Schmid, 2005) clearly takes issue with, and distances itself from, a global and fine-grained attention to the diffuse horizontalities of the country's territory. Instead, in the name of the "wealth of the whole organism," it expresses a preference for selecting, differentiating and hierarchizing its different parts with a view to its future development. It argues in favor of rearranging the country's political geography through five clearly distinct urbanization types—metropolitan regions, city networks, quiet zones, alpine resorts and alpine fallow lands—in the interest of "strengthening and completing processes already underway" (Diener et al., 2005). In this perception of the country, metropolitan areas—while widely supported by the recreational and rural territories—represent the very core of the interpretation, while the fallow lands remain as an un-integrated "void" at the periphery—both figuratively and literally—of "urban" Switzerland, thought to be functionally necessary but in fact performing no synergetic function within a larger whole. In such a view, the idea of the territory as a comprehensive, plural life-world traversed by multifunctional and multimedial diversity, seems largely abandoned.

2.4. The Possibility of a Counter-Image

This seems very problematic to us. In the extensive fieldwork activity we are conducting for this research, we have traced the transformations left on the ground—in settlements, landscapes and soils—by selective and increasingly exclusive policies. Meanwhile, the ongoing debates we are observing keep registering the difficulty in actually implementing densification in already built and already relatively dense areas. Accordingly, the "Horizontal Metropolis" hypothesis investigates the possibility of a cohesive project rooted in the already available richness of City-Territories' existing patterns of "decentralized centralization" (See Figure 2). We believe this is all the more timely and relevant because, despite the recent thrust of national policies towards supporting and emphasizing territorial hierarchization processes, the legacy of visions and models developed for over a century around the idea of territorial decentralization and of a "comprehensive use of the territory" is still very spatially visible all across the Swiss territory. This heritage seems to us to represent a very precious resource to face the country's future urban challenges if we are to avoid, or at least mitigate, the dismemberments, disruptions and exclusionary dynamics that are likely to come with the currently prevailing centralizing and polarizing view.

In order to develop a new body of research capable of opening up a debate that, otherwise, risks being weakened into insignificance by a culturally and politically hegemonic project of unmitigated metropolization, we believe it is necessary and urgent to articulate a counter-project. We would like to label that counter-project: "*From growth to development: Space as capital.*" By "growth" we mean the now conventional ideology that, out of a legitimate fear of indiscriminate urban sprawl, demographic increases need to be met with urban concentration and densification (with the associated dualism of rural and urban, built and open, etc.) in order to avoid territorial diffusion and the mixing-up of infrastructural, natural and cultural capital. In the conventional "growth" view, types of capital have to be kept separate in order to maximize the growth of each of them. By "development," on the contrary, we mean a settlement pattern which, while respecting the need to avoid arbitrary sprawl, views human, natural and social health and well-being as anchored in balanced and mixed qualitative evolution, with an intermeshing and interweaving of functions and modes of occupation on territories and with "isotropy" (the similar availability of micro- and macro-infrastructures in all spatial directions) and "fractality" (the similar availability of possibilities for living well at various geographical scales) as the key notions ruling the philosophy of design (Arnsperger, 2016).

The Swiss "City-Territory", as a whole, could then be read as a renewable resource, where recycling and reinvestment would reverse the idea that urbanization means mainly a process of waste. The Swiss "Horizontal Metropolis" could be considered as a new spatial-socio-ecological design issue, to be addressed starting from a careful reading and re-interpretation of the resources already present on the territory (see Figure 3). The Swiss "City-Territory", which historically was extensively inhabited all the way from the valleys to the "Plateau," is in fact characterized by a vast, qualitative and diffused support system for "urban life," made of fine-grained infrastructures and high-quality built capital. One telling example is the country's vast and capillary—we could say territorial—educational system, made up of schools and universities of different scales and kinds, put in place over more than a century with a view to fostering an "extensively educated society."

2.5. Approaching a Case Study: The West of Lausanne—Reframing the Periphery

In order to flesh out and operationalize the "Horizontal Metropolis" concept and to show its contribution to a new urban design approach, concrete design-oriented proposals, concrete "spaces" on which action is possible, need to be identified and rethought. The case of the West of Lausanne will be briefly outlined here to begin a confrontation with concrete territorial themes and to identify a first set of operational tools. Located in the extensive Swiss "City-Territory" and conceived as a periphery now gaining its autonomy, the West of Lausanne represents a good example for exploring the "Horizontal Metropolis" concept in the Swiss context.

For over a century, the West of Lausanne was the industrial periphery of a middle-size city; today, it is wit-

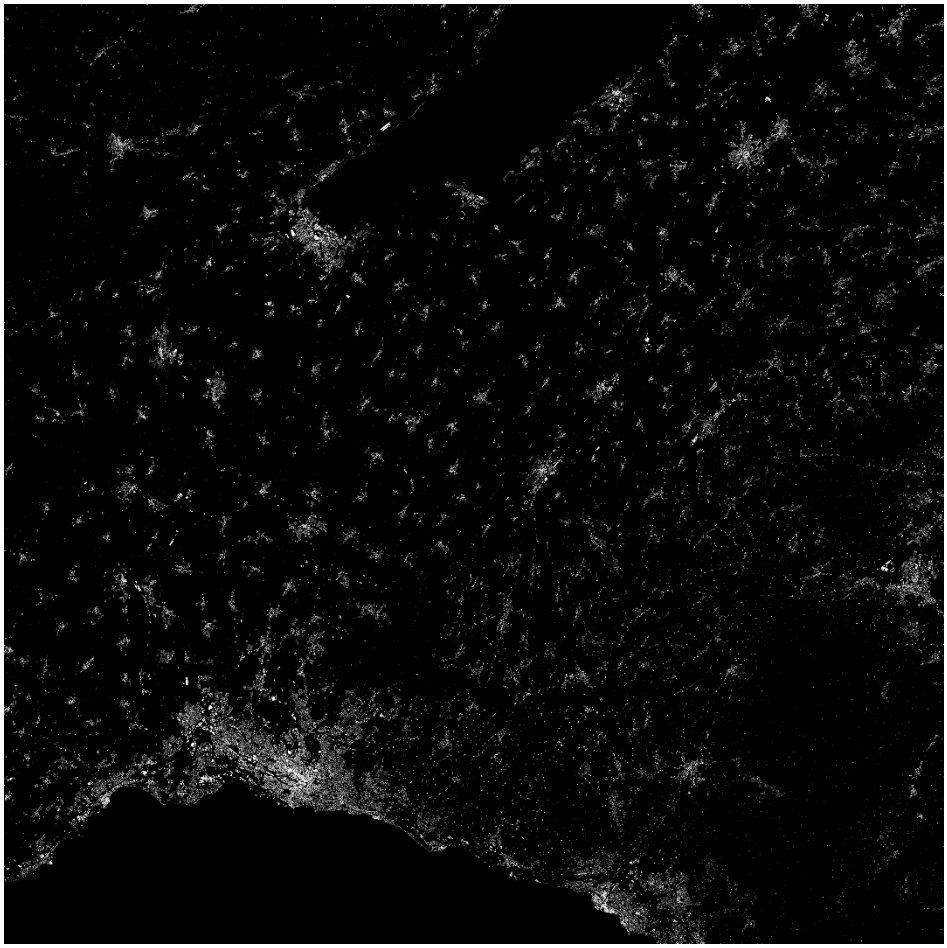

Figure 2. Canton of Vaud (2014), portion. 50x50 km: urban morphology: built (white). Source: *Horizontal Metropolis, a radical project*, Venice Architecture Biennale 2016, Atlases.

nessing an important transformation process which is likely to strongly modify its spatial and social character. The fundamental question, as in many other places in Europe, concerns the future of the industrial activities and the risk of overestimating the role of the tertiary economy. The urban "fabric," made up of villages, dormitory areas, rapidly transforming industries and vast agricultural plots, is extremely fragmented and heterogeneous. Transportation lines such as railways and highways running East-West interrupt already weak ecological networks (mainly watercourses and forests) which, on the contrary, run North-South. The West of Lausanne also contains the vast campus of two big universities dedicated to research and education, a space/economy that is becoming increasingly strategic for the Lausanne area.

In the attempt to re-frame this territory through the lens of the "Horizontal Metropolis" concept and to imagine and construct new design approaches, three strategies can be identified: spatial recycling, reduction of individual car- and truck-based mobility, and capitalization on embedded ecological rationalities. These strategies work through, respectively, the territory's "embodied energy," aiming at reworking the existing urban "stock" and at envisioning new life-cycles for abandoned and underused spaces; the idea of a more coherent and efficient public transport system, capable of inducing a significant decrease in car-based mobility; and the restoration of ecological continuities along water networks, where forests and reclaimed soils could evolve into a territorial park.

For each of these strategies a set of operational tools can be identified:

Spatial Recycling—Within the large existing industrial surfaces, which are already partly being reworked and where abandonment is fragmented and discontinuous, the ongoing incremental recycling of the West of Lausanne's space by small and medium-sized enterprises demonstrates the limits of contemporary *tabula rasa* strategies. In this domain, our first design explorations show that a firm commitment to maintaining production and manufacturing does not necessarily go against the strategy of upgrading the site's qualities: patches that are mixed in terms of land use can draw advantages from existing agricultural plots, and isolated dwellings can be reinforced by new ones. Through minute work on the permeability of the—mainly industrial—spaces and on the reestablishment of connectivity, even old industrial zones bound by infrastructural barriers can become spaces to live well in, with high-quality public standards. New continuities can be imagined connecting the indus-

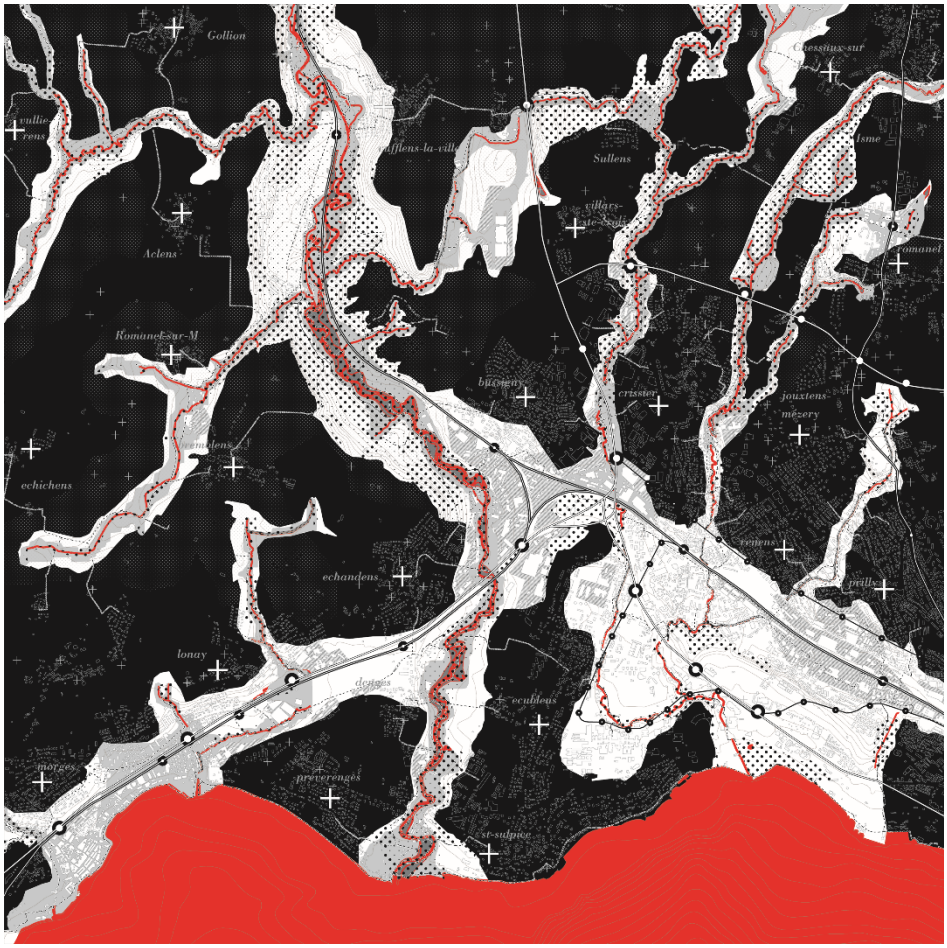

Figure 3. "The *espace rivière* as territorial park." West Lausanne Area, 10x10 km: water (red); *espace rivière* (white); room for water (grey); forest (dotted black); productive and logistic plots (lines hatch); agriculture (dotted white); railways, tramways and bus transportation system (line and black lines); villages (white crosses); built (light grey outlined). Source: EPFL Superstudio Students, fall 2014 and *Horizontal Metropolis, a radical project*, Venice Architecture Biennale 2016, Atlases.

trial, fractured and entrenched spaces to the villages, the agricultural areas and the city around them (see Figure 4). Strategic urban axes can be rethought and redesigned by exploiting, for instance, the construction of new planned tramway tracks and via the recycling of large commercial containers (see Figure 4). Small public spaces, scattered throughout the existing fabric, can take advantage and thrive on the natural patches that persist within them. Communal roofs that cover different buildings, as well as second skins, can have the dual function of producing energy and of making the new "urban fabrics" more comfortable. New urban agriculture and urban parks can be harnessed to built structures that get recycled and adapted to new energy standards.

Reduction of Individual Car- and Truck-Based Mobility (Towards a No-Car Scenario)—To reduce the level of resource and energy consumption, it is fundamental to rediscuss the current role of highways and railways. Accordingly, we need to investigate the spatial impact of a transition from a system based on freight trucks to a rail-based system. In the West of Lausanne it would possible to repurpose the existing highway, which literally cuts the area in two halves, as a BRT (Bus Rapid Transit) and to integrate it within a territory from which it has been almost completely disconnected except as a purveyor of external traffic flows entering or leaving the area. Along the highway new bus stops could allow the requalification of the leftover spaces facing the street, creating new public spaces at the back of the existing industrial and logistic facilities. A system of elevators could enable the highway to be reached by soft mobility and to be connected with the territorial park (see below). The large truck warehouses could be turned into public facilities and the train stations would constitute new poles of attraction, strongly connected to the new bus stations and the soft mobility network/recreational system.

A more efficient public transport system could also improve the connections between the villages to the north and the larger agglomerations to the south, close to the main infrastructures. In the marginal areas, near the stations, there is the potential for improving the typological mix, adding services and exploiting the proximity to agriculture.

Figure 4. "Reestablishment of territorial connectivity." West Lausanne Area: creation of new continuities between forested areas and industrial spaces. Insertion of new strategic urban axes and repurposing of the existing highway (integrated within the territory). Source: *Horizontal Metropolis, a Radical Project*, Venice Architecture Biennale 2016, Atlases.

Capitalization on Embedded Ecological Rationalities—Reversing the logic which, for decades, has built and structured this territory, water networks and "open soils" could become the starting point of a deep overhaul of the West of Lausanne's spatial structure. On the one hand the watercourses could, if managed, reshaped and transformed over time, represent new north-south continuities, both in terms of ecological coherence and of public space (see Figure 3). On the other hand, a renewed, more conscious relationship to soils, which are often trivialized, ignored, and even scorned in urban planning processes, could help mend the way urbanized territories are looked at and judged. If considered as a complex, integrated and integrating system characterized by a broad functional diversity, if taken into consideration not only as a surface (in a quantitative perspective) but also in a qualitative, three-dimensional perspective, well-managed soils could in fact help build sound valorization, compensation and climate change mitigation tools in an area that has inherited a rather negative socio-ecological reputation from its industrial past.

The *espace rivière* could become a territorial park establishing new continuities throughout the territory (see Figure 3). Along the watercourses, an enlarged forest system could surround the water basins for water catchment, so that the runoff from the road infrastructure could be collected via permeable pavements and treated. In the fields alongside the river, phytoremediation could prevent and mitigate problems of pollution—an issue that is of particular acuity for the West of Lausanne. The forest could represent a new unifying and connecting "buffer" between the currently segregated natural and urban environments—especially as historically, part of the West of Lausanne's stock of environmental capital was in fact located in close proximity to industrial activities—and could therefore become the device through which to identify, envision and grow new ecological pockets intermeshed with the urban fabric.

3. Conclusion: On the Necessity of a New Research Agenda

The case of the West of Lausanne is only one of the many urban conditions which can be rethought as part of the Swiss Horizontal Metropolis. These explorations show that we are in urgent need of an alternative set of concepts and actions to produce visions and operational tools to deal with future urban challenges—concepts and actions capable of overcoming the paradoxes and contradictions of the current urban condition and of critically reformulating and recasting mainstream debates around the future of urban growth. In the specific case

of the future of urban Switzerland to 2050 and beyond, visions, planning and design tools need to be articulated, starting from the investigation of concrete case studies and hypotheses and with an ability to cope with local-global instability, unbalance and uncertainty—in other words, to generate territorial resilience. To transform present risks into future opportunities, old dualistic ways of thinking are no longer called for. We need a new interpretation of the inhabitability of the Swiss territory, in relation to the infrastructural support system and the issue of social inclusion. We require a deeper understanding of the Swiss "City-Territory" as a renewable resource, by reflecting on new life cycles and capitalizing on the urban and territorial "embodied energy."

To this end, we have suggested and defended here the idea of "Horizontal Metropolis," which stands opposed to both indiscriminate sprawl and equally indiscriminate densification and concentration. Through the lens of the "Horizontal Metropolis," the exploratory case of the West of Lausanne was shown to suggest first possibilities for alternative and novel ways—based, in the case of Switzerland, of deeper inherited historical and ecological wisdom—of redesigning our cities and territories for the future.

Conflict of Interests

The authors declare no conflict of interests.

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